

10/564560
AP15 Rec'd 07/01/2006 - 2 JAN 2006

SEQUENCE LISTING

<110> Graham and Tonon

<120> Transgenic Cells

<130> 72576-01

<150> PCT/GB04/003057

<151> 2004-07-13

<150> 0316629.5

<151> 2003-07-16

<160> 19

<170> PatentIn version 3.1

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<213> Thalassiosira

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Gly Ala Thr Tyr Leu Pro Phe Glu Arg Phe Tyr Asp Pro Val Ala Thr
35 40 45

Leu Thr Trp Met Gln Asp Arg Pro Met Ile Pro Ile Ile Ala Cys Val
50 55 60

Ala Tyr Val Val Leu Ile Val Leu Gly Arg Ala Tyr Met Lys Asp Arg
65 70 75 80

Pro Ala Trp Ser Trp Arg Arg Ile Leu Ala Val Trp Asn Leu Ser Leu
85 90 95

Ser Leu Phe Ser Trp Ile Gly Ala Ile Arg Thr Ala Pro Gln Leu Tyr
100 105 110

Tyr Asn Leu Thr Thr Tyr Ser Leu Arg Asp Asn Leu Cys Asp Asp Pro
115 120 125

Ala Ala Leu Tyr Gly Ser Gly Ser Thr Gly Leu Trp Val Gln Leu Phe
130 135 140

Ile Leu Ser Lys Phe Pro Glu Leu Leu Asp Thr Phe Phe Ile Val Ile
145 150 155 160

His Lys Lys Pro Leu Ile Phe Leu His Trp Tyr His His Ile Thr Val
165 170 175

Leu Leu Tyr Cys Trp His Ser Tyr Val Thr Thr Ser Pro Ser Gly Leu
180 185 190

Phe Phe Val Val Met Asn Tyr Ser Val His Ala Val Met Tyr Gly Tyr
195 200 205

Tyr Phe Leu Met Ala Val Lys Phe Arg Pro Lys Trp Phe Asn Pro Met
210 215 220

Phe Val Thr Phe Met Gln Leu Ser Gln Met Phe Ile Gly Val Gly Val
225 230 235 240

Thr Ile Val Ala Phe Tyr Tyr Ser Asn Pro Ile Leu Gly Lys Thr
245 250 255

Cys His Ile Arg Lys Glu Asn Asn Val Ala Ala Phe Val Met Tyr Gly
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Val Lys Val Lys Gly Asp Ala Lys Lys Lys Val Val
290 295 300

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25

30

Ala Met Asp Pro Tyr Pro Ile Lys Phe Leu Tyr Asn Val Ser Gln Ile
35 40 45

Phe Leu Cys Ala Tyr Met Thr Val Glu Ala Gly Phe Leu Ala Tyr Arg
50 55 60

Asn Gly Tyr Thr Val Met Pro Cys Asn His Phe Asn Val Asn Asp Pro
65 70 75 80

Pro Val Ala Asn Leu Leu Trp Leu Phe Tyr Ile Ser Lys Val Trp Asp
85 90 95

Phe Trp Asp Thr Ile Phe Ile Val Leu Gly Lys Lys Trp Arg Gln Leu
100 105 110

Ser Phe Leu His Val Tyr His His Thr Thr Ile Phe Leu Phe Tyr Trp
115 120 125

Leu Asn Ala Asn Val Leu Tyr Asp Gly Asp Ile Phe Leu Thr Ile Leu
130 135 140

Leu Asn Gly Phe Ile His Thr Val Met Tyr Thr Tyr Tyr Phe Ile Cys
145 150 155 160

Met His Thr Lys Asp Pro Lys Thr Gly Lys Ser Leu Pro Ile Trp Trp
165 170 175

Lys Ser Ser Leu Thr Ala Phe Gln Leu Leu Gln Phe Thr Ile Met Met
180 185 190

Ser Gln Ala Thr Tyr Leu Val Phe His Gly Cys Asp Lys Val Ser Leu
195 200 205

Arg Ile Thr Ile Val Tyr Phe Val Tyr Ile Leu Ser Leu Phe Phe Leu
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Phe Ala Gln Phe Phe Val Gln Ser Tyr Met Ala Pro Lys Lys Lys Lys
225 230 235 240

Ser Ala

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20 25 30

Val Gly Ala Ala Leu His Ser Gly Ser Ser Tyr Ala Val Trp Val His
35 40 45

Tyr Cys Asp Lys Tyr Leu Glu Phe Phe Asp Thr Tyr Phe Met Val Leu
50 55 60

Arg Gly Lys Met Asp Gln Val Ser Phe Leu His Ile Tyr His His Thr
65 70 75 80

Thr Ile Ala Trp Ala Trp Trp Ile Ala Leu Arg Phe Ser Pro Gly Gly
85 90 95

Asp Ile Tyr Phe Gly Ala Leu Leu Asn Ser Ile Ile His Val Leu Met
100 105 110

Tyr Ser Tyr Tyr Ala Leu Ala Leu Leu Lys Val Ser Cys Pro Trp Lys
115 120 125

Arg Tyr Leu Thr Gln Ala Gln Leu Leu Gln Phe Thr Ser Val Val Val
130 135 140

Tyr Thr Gly Cys Thr Gly Tyr Thr His Tyr Tyr His Thr Lys His Gly
145 150 155 160

Ala Asp Glu Thr Gln Pro Ser Leu Gly Thr Tyr Tyr Phe Cys Cys Gly
165 170 175

Val Gln Val Phe Glu Met Val Ser Leu Phe Val Leu Phe Ser Ile Phe
180 185 190

Tyr Lys Arg Ser Tyr Ser Lys Lys Asn Lys Ser Gly Gly Lys Asp Ser
195 200 205

Lys Lys Asn Asp Asp Gly Asn Asn Glu Asp Gln Cys His Lys Ala Met
210 215 220

Lys Asp Ile Ser Glu Gly Ala Lys Glu Val Val Gly His Ala Ala Lys
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Asp Ala Gly Lys Leu Val Ala Thr Ala Ser Lys Ala Val Lys Arg Lys
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Gly Thr Arg Val Thr Gly Ala Met
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20															

Leu	Thr	Ile	Val	Gly	Asp	Ala	Val	Tyr	Asp	Ala	Lys	Ala	Phe	Arg	Asp
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35															

Glu	His	Pro	Val	Gly	Ala	His	Phe	Val	Ser	Leu	Phe	Gly	Gly	Arg	Asp
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Ala	Thr	Glu	Ala	Phe	Met	Glu	Tyr	His	Arg	Arg	Thr	Trp	Pro	Lys	Ala
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Arg	Met	Ser	Lys	Phe	Phe	Val	Gly	Ser	Leu	Asp	Ala	Ser	Glu	Lys	Pro
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Thr	Gln	Ala	Asp	Ser	Ala	Tyr	Leu	Arg	Leu	Cys	Ala	Glu	Val	Asn	Ala
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Leu Leu Pro Lys Gly Ser Gly Gly Phe Ala Pro Pro Ser Tyr Trp Leu
115 120 125

Lys Ala Ala Ala Leu Val Val Ala Ala Val Ser Ile Glu Gly Tyr Met
130 135 140

Leu Leu Arg Gly Lys Thr Leu Leu Leu Ser Val Phe Leu Gly Leu Val
145 150 155 160

Phe Ala Trp Ile Gly Leu Asn Ile Gln His Asp Ala Asn His Gly Ala
165 170 175

Leu Ser Arg His Ser Val Ile Asn Tyr Cys Leu Gly Tyr Ala Gln Asp
180 185 190

Trp Ile Gly Gly Asn Met Val Leu Trp Leu Gln Glu His Val Val Met
195 200 205

His His Leu His Thr Asn Asp Val Asp Ala Asp Pro Asp Gln Lys Ala
210 215 220

His Gly Val Leu Arg Leu Lys Pro Thr Asp Gly Trp Met Pro Trp His
225 230 235 240

Ala Leu Gln Gln Leu Tyr Ile Leu Pro Gly Glu Ala Met Tyr Ala Phe
245 250 255

Lys Leu Leu Phe Leu Asp Ala Leu Glu Leu Leu Ala Trp Arg Trp Glu
260 265 270

Gly Glu Lys Ile Ser Pro Leu Ala Arg Ala Leu Phe Ala Pro Ala Val
275 280 285

Ala Cys Lys Leu Gly Phe Trp Ala Arg Phe Val Ala Leu Pro Leu Trp
290 295 300

Leu Gln Pro Thr Val His Thr Ala Leu Cys Ile Cys Ala Thr Val Cys
305 310 315 320

Thr Gly Ser Phe Tyr Leu Ala Phe Phe Phe Phe Ile Ser His Asn Phe
325 330 335

Asp Gly Val Gly Ser Val Gly Pro Lys Gly Ser Leu Pro Arg Ser Ala
340 345 350

Thr Phe Val Gln Arg Gln Val Glu Thr Ser Ser Asn Val Gly Gly Tyr
355 360 365

Trp Leu Gly Val Leu Asn Gly Gly Leu Asn Phe Gln Ile Glu His His
370 375 380

Leu Phe Pro Arg Leu His His Ser Tyr Tyr Ala Gln Ile Ala Pro Val
385 390 395 400

Val Arg Thr His Ile Glu Lys Leu Gly Phe Lys Tyr Arg His Phe Pro
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Thr Val Gly Ser Asn Leu Ser Ser Met Leu Gln His Met Gly Lys Met
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Gly Thr Arg Pro Gly Ala Glu Lys Gly Gly Lys Ala Glu
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<400> 10
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tcttacacctca actaccagat cgagcatcat ctgttcccgat ccatgcccga attccgcccac 240
ccgacgatcg cgccgcgcgt caaggcgctc ttcgagaagc acgggctgca ctatgacgtg 300
cgcggtact ttgaggcgat ggccgacacg ttcatgaacc ttgacaagggt cggcaacgcg 360
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gcgtcggcgc gcggcggcgt gcacgggagc acaaagtgtat ggatggaccc tgggcgacgc 480
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tgcagagctt gggcgcgatt ggaggcaggg ccggggcggt cggcggttcgc gagtctggcg 600
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aaaaaaaaaa aaaaaaaaaa aa

682

<210> 11
<211> 125
<212> PRT
<213> Pavlova lutherii

<400> 11

Ala Arg Gly Cys Cys Tyr Leu Leu Tyr Val Ser Leu Gly Ser Met Tyr
1 5 10 15

Ile Phe Cys Asn Phe Ala Val Ser His Thr His Leu Pro Ile Val Glu
20 25 30

Ala Asp Gln His Ala Thr Trp Val Glu Tyr Ser Ala Asn His Thr Thr
35 40 45

Asn Cys Ala Pro Ser Trp Trp Cys Asp Trp Trp Met Ser Tyr Leu Asn
50 55 60

Tyr Gln Ile Glu His His Leu Phe Pro Ser Met Pro Gln Phe Arg His
65 70 75 80

Pro Thr Ile Ala Pro Arg Val Lys Ala Leu Phe Glu Lys His Gly Leu
85 90 95

His Tyr Asp Val Arg Gly Tyr Phe Glu Ala Met Ala Asp Thr Phe Met
100 105 110

Asn Leu Asp Lys Val Gly Asn Ala His Glu His Asn His
115 120 125

<210> 12
<211> 1340
<212> DNA
<213> Pavlova lutherii

<400> 12

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gtcggccccc gcttcctgta caacgcggtc gtcttctcggt cggtgcaaggc gctgctcgcc 120

ggtcgcgtgc gcatgatggt cgccggctcc gcgcctctt ccggccgacgt gcagaagttt 180

gtgcaatcggt gcttcaacgc gccgcttcgc caaggctacg gcctcaccga gacgtgcgcg 240

gcgacgacgc tctgcgcgct gcacgacaac acgcccgtcgc aagttgggcc gccgcaggag 300

tcggcgtgca	tcacgctgca	cgactggag	gagggcaact	accgcaaccg	cgacgccaac	360
gaccggcca	tcgggatgca	gcgcggcgag	atcctgatcg	gtgggcccgc	cgtctgcctc	420
ggctactacg	tgaacgagcg	cgcgcggac	gcggacgtgg	tgaagcgaa	cgcggaggac	480
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agcggctgca	tgcagattat	cgaccgaaag	aaggacctcg	tcaagctgca	gcagggcgag	600
tacgtcgcgc	tctccaaggt	ggagaacgca	ctcaagaact	cgtcgtacac	gcagatcccg	660
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gagaatgaca	tgctcaccac	gacgatgaag	atcaagcgca	agccaatcgc	tgaccggcac	960
gcgagcgaga	tcaaggccgt	ttacgtctga	gcccgcgcct	ttttgtacaa	cctcgagagc	1020
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tgctgagcag	aaggcagtct	ccggctctcg	acaggtggcg	cccgttgtc	agaatgttcg	1200
cagccctcc	ccctcgggc	ggctgccatt	cggggcagcg	ctcgacatg	tgtgcgcctc	1260
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aacgaccgtt	gccctcgac					1340

<210> 13
 <211> 329
 <212> PRT
 <213> Pavlova lutherii

<400> 13

Ala	Arg	Gly	Leu	Phe	Gly	Trp	Ala	Leu	Asp	Asp	Ala	Leu	Ala	Lys	Tyr
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Asp	Lys	Gly	Gly	Val	Gly	Pro	Gly	Phe	Leu	Tyr	Asn	Ala	Val	Val	Phe
				20				25					30		

Ser	Ser	Val	Gln	Ala	Leu	Leu	Gly	Gly	Arg	Val	Arg	Met	Met	Val	Ala
				35				40				45			

Gly Ser Ala Pro Leu Ser Ala Asp Val Gln Lys Phe Val Gln Ser Cys
50 55 60

Phe Asn Ala Pro Leu Arg Gln Gly Tyr Gly Leu Thr Glu Thr Cys Ala
65 70 75 80

Ala Thr Thr Leu Cys Ala Leu His Asp Asn Thr Pro Ser Gln Val Gly
85 90 95

Pro Pro Gln Glu Ser Ala Cys Ile Thr Leu Arg Asp Trp Glu Glu Gly
100 105 110

Asn Tyr Arg Asn Arg Asp Ala Asn Asp Pro Ala Ile Gly Met Arg Arg
115 120 125

Gly Glu Ile Leu Ile Gly Gly Pro Ala Val Cys Leu Gly Tyr Tyr Val
130 135 140

Asn Glu Arg Ala Pro Asp Ala Asp Val Val Lys Arg Asn Ala Glu Asp
145 150 155 160

Phe Val Thr Ile Asn Gly Met Arg Phe Phe Cys Ser Gly Asp Ile Gly
165 170 175

Gln Ile Thr Pro Ser Gly Cys Val Gln Ile Ile Asp Arg Lys Lys Asp
180 185 190

Leu Val Lys Leu Gln Gln Gly Glu Tyr Val Ala Leu Ser Lys Val Glu
195 200 205

Asn Ala Leu Lys Asn Ser Ser Tyr Thr Gln Ile Pro Tyr Val Tyr Ala
210 215 220

Leu Ser Ser Lys Ser Tyr Cys Ile Ala Leu Leu Cys Pro Gln His Ala
225 230 235 240

Ala Ile Arg Gln Leu Ala Ala Ser Leu Gln Ile Ser Gly Lys Glu Leu
245 250 255

Ser Glu Leu Cys Ala His Pro Gln Ile Val Ala Ala Val Leu Lys Asp
260 265 270

Leu Gln Ala Gln Cys Lys Ala Ala Lys Leu Ala Gly Phe Glu Thr Pro

275

280

285

Ser Lys Leu Ile Leu Val Ser Asp Glu Trp Thr Val Glu Asn Asp Met
 290 295 300

Leu Thr Thr Thr Met Lys Ile Lys Arg Lys Pro Ile Ala Asp Arg His
 305 310 315 320

Ala Ser Glu Ile Lys Ala Val Tyr Val
 325

<210> 14
 <211> 1099
 <212> DNA
 <213> Pavlova lutherii

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 gttccactgg aagggtacgc tgccgctgct cgcctttat ctcgcgtcgt acctcgacgg 180
 cggcgaggtg cgcgtaaagc gcgtgcgcgc gtggccggcg ttctccggc atttttggct 240
 gttcacgttc atgcgcaggg tctaccggca ggcgcgttac gtgcgcgtg gcctcgaggc 300
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 cctcgacggc cagctgctcg acctactgcc cgcgcgtcgc ggcaagatgc gctggctcgc 420
 ggcgagcgtg ctcttcggc ttcccatcgat ggcgcgtc accctttgga cccggctgcatt 480
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 gcccggccgc gagcaggagc agctgcgcac ggcgtacggg cgcgagtcgg tatatttgcg 600
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 cgtgttcggg tgcgtcgacc tggaccacac ttcatccctg ctcttcgtgg cgcgcgtcg 720
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 ggcgcgcctt gctgtgcgc tcaacgtcgt gatcgccgg ccgatcaagc tgccgcgca 840
 ccctgagccg accgatgagg acgtcgccgc cgcgcgtcgc cagtagatcg ccgcgcgtcgc 900
 cgcgcgtctt gacgagaaca aggccgcgtt tggctatgcc gaccgcgagc tggagggtgt 960
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cagaaaaaaaaaaaaaaa

1099

<210> 15
<211> 315
<212> PRT
<213> Pavlova lutherii

<400> 15

Met Ala Ala Arg Ala Val Asp Ala Leu Val Val Ser Ala Phe Thr Ala
1 5 10 15

Phe Val Gln Ile Gly Val Trp Ala Leu Thr Pro Val Gly Ile Ala Trp
20 25 30

Ala Leu Ala Phe His Trp Lys Val Thr Leu Pro Leu Leu Ala Leu Tyr
35 40 45

Leu Ala Ser Tyr Leu Asp Gly Ala Glu Val Arg Val Lys Arg Val Arg
50 55 60

Ala Trp Pro Ala Phe Ser Arg His Phe Trp Leu Phe Thr Phe Met Arg
65 70 75 80

Arg Val Tyr Arg Gln Arg Val His Val Pro Ala Gly Leu Glu Ala Glu
85 90 95

Glu Gln Ile Ile Leu Ala Leu His Pro His Gly Ser Met Ala Asp Tyr
100 105 110

Arg Ala Ile Leu Asp Gly Gln Leu Leu Asp Leu Leu Pro Ala Leu Arg
115 120 125

Gly Lys Met Arg Trp Leu Ala Ala Ser Val Leu Phe Arg Leu Pro Ile
130 135 140

Val Arg Glu Leu Thr Leu Trp Thr Gly Cys Ile Asp Ala Arg Arg Ser
145 150 155 160

Val Ala Glu Ser Ala Leu Arg Gly Gly Tyr Ser Val Gly Val Leu Pro
165 170 175

Gly Gly Glu Gln Glu Gln Leu Arg Thr Arg Tyr Gly Arg Glu Ser Val
180 185 190

Tyr Leu Arg Lys Arg Phe Gly Phe Val Lys Leu Ala Leu Arg Phe Gly
195 200 205

Val Pro Leu Val Pro Gly Tyr Val Phe Gly Cys Val Asp Leu Tyr His
210 215 220

Thr Ser Ser Leu Leu Phe Ser Ala Arg Glu Trp Leu Val Arg Ser Leu
225 230 235 240

Gly Val Cys Val Pro Val Cys Phe Gly Ala Trp Gly Val Pro Met Ala
245 250 255

Pro Leu Ala Val Pro Leu Asn Val Val Ile Gly Arg Pro Ile Lys Leu
260 265 270

Pro Arg Asn Pro Glu Pro Thr Asp Glu Asp Val Ala Arg Ala Leu Asp
275 280 285

Gln Tyr Ile Ala Ala Leu Arg Ala Leu Phe Asp Glu Asn Lys Ala Arg
290 295 300

Phe Gly Tyr Ala Asp Arg Glu Leu Glu Val Cys
305 310 315

<210> 16
<211> 2061
<212> DNA
<213> Pavlova lutherii

<400> 16
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cggccgcgtt caaccacttt cccaagatca cgcgcgcga cctcgccgag atctggcgat 240
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accagatgaa ggactccgta cagagctact cacttggcgg gatgggttgc tcagcgggac	780
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ccttggctt gacccgctcg g	2061

<210> 17
 <211> 501
 <212> PRT
 <213> Pavlova lutherii

<400> 17

Met Ala Ala Pro Thr Ser Pro Tyr Gly Ala Glu Ser Pro Arg Ala Ala
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Tyr Ala Tyr Pro Glu Arg Ala Asn Val Lys Met Ser Glu Ala Leu Arg
20 25 30

Val Leu Asp Glu Gly Val His Pro Leu Val Ile His Ser Ser Gln Ile
35 40 45

Leu Ala Ala Ala Leu Leu Val Thr Ala Ala Val Asn His Phe Pro Lys
50 55 60

Ile Thr Val Ala Asp Leu Ala Glu Ile Trp Arg Ser Leu Gln Ile Asp
65 70 75 80

Val Ala Tyr Ala Phe Ala Leu Thr Ala Val Ala Val Leu Leu Leu Gly
85 90 95

Tyr Tyr Ala Leu Arg His Pro Arg Pro Val Tyr Leu Val Asp Phe Ala
100 105 110

Thr Trp Gln Leu Arg Asp Asp Lys Asp Asp Gly Ser Leu Ser Ala Thr
115 120 125

Ser Asp Phe Phe Arg Ser Thr Ile Thr Asp Cys Gly Asn Phe Cys Asp
130 135 140

Glu Ser Val Asp Phe Gln Met Lys Leu Phe Glu Arg Asn Gln Ile Ser
145 150 155 160

Glu Arg Cys Tyr Phe Pro Pro Gly Ile Arg Ala Tyr Arg Lys Gly Glu
165 170 175

Arg Asp Phe Asp Phe Ser Met Ala Ala Ala Arg Lys Glu Phe Glu Thr
180 185 190

Val Val Phe Thr Thr Val Asp Glu Leu Leu Ala Lys Thr Gly Val Lys
195 200 205

Pro Arg Asp Ile Asp Ile Leu Val Val Asn Cys Ser Leu Phe Asn Pro
210 215 220

Thr Pro Ser Leu Ala Ala Ile Val Ile Asn His Tyr Gln Met Lys Asp
225 230 235 240

Ser Val Gln Ser Tyr Ser Leu Gly Gly Met Gly Cys Ser Ala Gly Leu
245 250 255

Ile Ser Ile His Leu Ala Lys Asp Leu Leu Gln Val Tyr Pro Arg Lys
260 265 270

Arg Ala Leu Val Ile Ser Thr Glu Asn Ile Thr Gln Asn Phe Tyr Gln
275 280 285

Gly Asn Glu Lys Ser Met Leu Ile Ser Asn Thr Leu Phe Arg Met Gly
290 295 300

Gly Ala Ala Val Leu Leu Ser Gly Arg His Ala Asp Arg Arg Val Ala
305 310 315 320

Lys Tyr Gln Leu Leu His Thr Val Arg Thr His Lys Gly Ala Asp Pro
325 330 335

Asp Ala Tyr Arg Cys Val Phe Gln Glu Glu Asp Lys Ala Gly His Val
340 345 350

Gly Val Arg Leu Ser Lys Asp Val Met Glu Cys Ala Gly Ala Ala Met
355 360 365

Lys Thr Asn Ile Ser Val Leu Ala Pro Leu Ile Leu Pro Val Ser Glu
370 375 380

Gln Val Arg Phe Leu Ala Asn Tyr Val Ala Arg Lys Trp Leu Arg Met
385 390 395 400

Lys Gly Val Lys Gly Tyr Val Pro Asp Phe Thr Thr Ala Val Gln His
405 410 415

Phe Cys Ile His Thr Gly Gly Arg Ala Val Leu Asp Ala Leu Gln Ala
420 425 430

Asn Leu Ser Leu Ser Asp Tyr Tyr Leu Glu Pro Ser Arg Tyr Ser Leu
435 440 445

Trp Arg Trp Gly Asn Val Ser Ser Ala Ser Val Trp Tyr Glu Leu Asp
450 455 460

Trp Leu Glu Lys Ser Gly Arg Ile Arg Arg Gly Asp Lys Val Trp Gln
465 470 475 480

Ile Gly Phe Gly Ser Gly Phe Lys Cys Asn Ser Ala Val Trp Arg Ala
485 490 495

Cys Arg Ala Met Pro
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<210> 18

<211> 1113

<212> DNA

<213> Pavlova lutherii

<400> 18

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atagtgcagg	ggccggggag	gcggtgccca	cccgcgctcg	caaagcggtc	gcgctccctt	1020

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ttcgctt	gt gcttccgtat agatggtcaa gcc	1113
<210>	19	
<211>	320	
<212>	PRT	
<213>	Pavlova lutherii	
<400>	19	
His	Glu Ala Ser Cys Arg Ile Arg His	Glu Ala Ala Leu Trp Ser Trp
1	5	10 15
Leu	Pro Thr Tyr Asp Glu Phe Val Asp Gly Leu Ser Phe Val Asp Arg	
20	25	30
Glu	Lys Ile Gly Val His Met Val Asp Gln Gly Val Ile Thr Ser Ala	
35	40	45
Glu	Trp Ala Ala Ile Ser Val Asp Lys His Met Ser Phe Phe Ser Asp	
50	55	60
Ala	Ala Glu Phe Thr Gly Asp His Trp Ile Ile Pro Leu Val Ala Val	
65	70	75 80
Ala	Leu Tyr Leu Val Met Ile Val Val Gly Pro Met Ile Met Ala Asn	
85	90	95
Arg	Pro Pro Leu Pro Val Asn Gly Leu Ala Cys Ala Trp Asn Trp Phe	
100	105	110
Leu	Ala Ala Phe Ser Thr Phe Gly Val Ala Cys Thr Trp His Cys Ile	
115	120	125
Phe	Thr Arg Leu Arg Ser Arg Gly Phe Glu Ser Thr Thr Cys Gly Ser	
130	135	140
Ala	Met Phe Met Ser Gln Gly Tyr Val Gly Leu Ala Met Leu Leu Phe	
145	150	155 160
Ile	Tyr Ser Lys Leu Phe Glu Leu Ile Asp Thr Phe Phe Leu Ile Ala	
165	170	175
Lys	Lys Ala Asp Val Ile Phe Leu His Trp Tyr His His Val Thr Val	

180

185

190

Leu Leu Tyr Cys Trp His Ser His Ser Val Arg Ile Pro Ser Gly Ile
195 200 205

Trp Phe Ala Ala Met Asn Tyr Phe Val His Ala Ile Met Tyr Ser Tyr
210 215 220

Phe Ala Met Thr Gln Met Gly Pro Arg Tyr Arg Lys Leu Val Arg Pro
225 230 235 240

Tyr Ala Arg Leu Ile Thr Thr Leu Gln Ile Ser Gln Met Phe Val Gly
245 250 255

Leu Ile Val Asn Gly Ser Ile Ile Tyr Phe Thr Ser Leu Gly His Ala
260 265 270

Cys Lys Ser Ser Lys Thr Asn Thr Ile Leu Ser Trp Leu Met Tyr Leu
275 280 285

Ser Tyr Phe Val Leu Phe Gly Leu Leu Tyr Leu Arg Asn Tyr Ile Leu
290 295 300

Gly Thr His Gly Lys Pro Ala Gly Lys Arg Ala Lys Gly Lys Ala Glu
305 310 315 320